

sunshine

THE MAGAZINE FOR TEENS

MARCH 1976

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Tg's Comments



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YOUTH MONTHLY WITH A WORLD VIEW
FOUNDED IN 1954

VOL 22 NO. 8

MARCH 1976

PURPOSE

This Asian Youth Monthly is sponsored by the *Children's Sunshine Concerns*, a registered Non-profit educational Public Trust organized to ensure the all-round welfare of youth and to promote international understanding. SUNSHINE, founded in 1954, aims at fostering among boys and girls, 12-16, a democratic attitude, the service-above-self ideal, a sense of national unity and a world outlook. It also provides them with general knowledge, citizenship training, hints on efficiency and growing up, and appealing English language practice—all the pleasant way. It seeks to serve their age-equals abroad as a dependable bridge of friendship, and to meet the needs and interests of youth everywhere by giving them literature that is educative, edifying and entertaining.

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OUR COVER	
In 1976 we have the 200th Anniversary of the American Declaration of Independence. Benjamin Franklin, Thomas Jefferson and George Washington were some of the outstanding figures of that time.	

NATION ON THE MOVE

Towards reduction of inequality

The income-tax exemption limit has been raised to Rs. 8,000 (it was Rs. 6,000); this brings relief to 7 lakh tax-payers. Side by side, new assesseees have been discovered; last year 1.33 lakh persons were served notice for payment of income-tax.

Today there is ample encouragement for personal saving (savings up to Rs. 4,000 a year are totally tax-free) and there is punishment for those who seek to cheat the State.



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Citizenship Equals Freedom Plus Responsibility

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A GREAT struggle took place in India between 1910 and '47 to make our country free. Countless men and women suffered police lathis and jail terms. Thousands gave up the idea of a personal 'career' in order to . . . but why did they do it? It was in order that their successors, you who are reading this, could know what it is to be citizens of a free country. Their fight was not a mere struggle against the British Empire, but a struggle for the people of India. They wanted the people to have the very same freedoms enjoyed by British citizens.

For so many hundreds of years before, there had been in India nothing but arbitrary rulers of one kind or another who did not allow the people to decide anything. As a result, as Vivekananda and Aurobindo said, the character of the people of India had deteriorated. They were willing to serve any master, to slavishly obey any order just to improve their own condition at the expense of others.

Gandhiji challenged people to think of others first, to raise our sights to the needs of the country as a whole; to believe in the power of people making collective decisions; to become sarvodaya voluntary workers so as to help villagers to give up old divisions of caste and to work together for progress.

By making the free choice to serve one's fellow countrymen, we learn how to be a citizen. We can do this in our spare time, on week-ends, by visiting a ward in a hospital or cleaning up some neglected area or conducting games in a municipal school. We can do this during part of our holiday by joining in a village uplift project—cleaning a tank or well, making channels for waste water in the village, or painting the school building.

Full citizenship requires that we take responsibility for what is happening to others. We must feel personally involved in the injury or injustice suffered by our neighbour. A true citizen does not wait for the government to do something or look around for someone in authority to tell him what to do. Think of the story of the Good Samaritan.

Freedom fighters made their sacrifices so that you could be free citizens. Citizenship means you think yourself responsible, not only for yourself but for your neighbour too. Far from waiting to be told what to think or do, you should have your own thoughts about what needs to be done in each situation, and how it can be put into action.

It is owing to the continuous field work over the years of so many constructive workers that the Points which make up the 20 Point Programme (see SUNSHINE for Jan-Feb 1976) were chosen by the Prime Minister for special attention. Most of these points concern what needs to be done to make the poor and weak really free. "Independence" and Elections can mean nothing to a family which is tied down to a system of bonded labour, for example. Liberty as an ideal must be made true in practice for everyone. Let the immortal words of Patrick Henry (1775) inspire you:

"Is life so dear, or peace so sweet, as to be purchased at the price of chains and slavery? Forbid it, Almighty God! I know not what course others may take, but as for me, give me liberty or give me death!"

With Liberty goes a personal sense of Responsibility. These two go together to make a democratic country strong.

—YOUR EDITOR

more than one such "contribution."

There were many remarkable persons to whom America owes its independence, but perhaps the most likeable was

BENJAMIN FRANKLIN

THE OLD MAN was packing his belongings at his London flat in March 1775. He had lived for 15 years here in the heart of the Empire, promoting American rights within the British system. But he had failed to gain these rights. Now, in his 69th year, he was sadly sailing back to join the Revolutionaries he had encouraged from afar. Little did he realise that his greatest achievements were still ahead—and in Europe. But the story begins much earlier. . .

His father, a Boston candle-maker, could not send him to school for long. But he loved to read in his father's small library of classics. He also taught himself to write by using the *Spectator*, a London weekly, as a text. After taking notes on an essay, he would put them aside; later he would try to rewrite the piece from the notes, and then he would correct it against the original.

At 12 years of age, Benjamin pledged himself to a 5-year apprenticeship, the most common form of schooling in those days. The craft he learnt was printing and it was to give him the basic freedom of economic independence. Young Ben quickly discovered the joys of journalism. He would write social commentaries and get them published under the pen-name Silence Dogood, supposed to be a country widow who was "a friend to Vertue . . . a mortal Enemy to arbitrary Government and unlimited Power." In this disguise, he poked fun at Harvard University, attacked religious hypocrisy, and promoted education for women. All this as a teenager!

At 17 he ran away to start anew in Philadelphia, 350 miles to the south. There he quickly built up a good business as a printer, producing everything from hymn-books to handbills. But his restless mind

was interested in everything. First he brought together some friends "into a Club for mutual Improvement." These self-employed craftsmen would meet at a tavern on Friday nights to mix moderate drinking with heavy thinking. What does our town need most? Which of our friends is in trouble?

They answered with advice, loans, business, ideas. Once a project was chosen, Franklin's tactics implemented it: First discuss and refine the idea. Write it down; improve it. Publish an article about it in the *Pennsylvania Gazette* to test public opinion. Gather signatures; petition the Assembly for action.

For instance, medical care then was terrible. The patient with money could call a "doctor" to the home, but the penniless



In those days, bank notes were easy to counterfeit. In Franklin's press, however, they gave each note the ink impression of a real leaf. The leaf impressions on all genuine notes would be identical.

could only stumble to the Poorhouse. However, with the construction of the Pennsylvania Hospital, America had its first medical centre open to all. To set it up, Franklin invented the idea of "matching funds": When subscribers promised 2000 pounds, the Pennsylvania Assembly was pressured into donating an equal amount. . . . Poor people had little chance for an education. So Franklin and his friends began a Public Academy to give needy boys a practical education. It lives today as the great University of Pennsylvania. . . . Since books were expensive and had to be imported from London, few could afford to have their own library. Franklin's club began the Library Company, where subscribers pooled their funds to build up a good collection for common use.

He was also an inventor. The *Franklin stove* (to burn wood efficiently) is still made and used today; bifocal spectacles and the lightning rod were other useful things he developed. The last was the result of a historic electrical experiment which Franklin and his 21-year old son undertook. Till then no one knew what lightning was, though some scientists believed it was related to the static electricity one felt when rubbing fur or ebony. Determined to solve this mystery, Franklin attached a piece of metal wire to a kite, flew it into a thunderstorm, and tied a metal key to the lower end of the string. (Luckily they did not know that if a bolt of lightning struck the kite, the jolt would travel down the wet string and might electrocute both of them.) The electric charges caused the key to dance and tingle inside a static electricity jar. They had demonstrated that lightning and electricity were one and the same!

By this time, Franklin the scientist, inventor and citizen was also becoming a seasoned politician. In 1736 he began 15 years as Clerk to the Pennsylvania Assembly, sitting by the speaker's chair to record the debates. The job also gave him an ad-



To commemorate British surrender (1781), Franklin designed his medallion depicting France as the Goddess Minerva defending the cradle of Hercules—the infant United States—from the British lion. e/

vantage in obtaining the assembly's printing business.

As the colonies grew older, conflicts arose with Parliament in London which ruled them like provinces. In 1760, Franklin was asked to go to London on behalf of Pennsylvania. And there he stayed till the eve of the Revolution. One of his problems concerned paying for the "French and Indian" wars which had added Canada to the British possessions. As in all 'successful' wars, Britain, the victor, was now bankrupt. British landowners were already heavily taxed and all Englishmen paid a stamp tax on documents. The solution: Tax the colonists! On paper, in London, this solution must have looked so simple, so reasonable. But it was bitterly opposed in the colonies.

In 1766 Franklin himself stood before Parliament to speak against the Stamp Act. His appearance was stage-managed by the great liberal M.P., Edmund Burke. Other friendly M.P.'s had been given questions to ask which would make Franklin's task easier.

*(explain meaning)

INDIA IN 2000 A.D.

(Part 2)

THE prosperity of a society can be calculated by measuring the amount of food, housing and energy available to each person in the population. *Per capita*, food and housing has been decreasing recently despite bumper harvests and the efforts of the housing boards. This is because the population has been growing as fast or faster than food production and because more and more people are shifting from villages (where they can build clean bamboo-and-thatch huts for themselves) to towns and cities. The illustration in our last issue shows how the population of India is doubling between 1965 and 2000. To appreciate the seriousness of this imagine that a "Second India" is being added in this time to share our land, water and industries. All these additional people will require food and clothing, education and jobs.

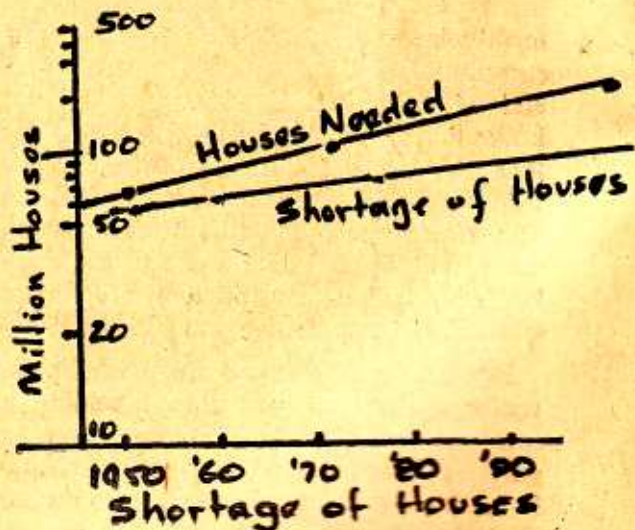
Most scientists doubt that *per capita* availability of food, particularly of pulses and grams—which provide vital proteins—can be maintained if population growth keeps up. In drought years (and 2 years in every five have bad monsoons) the situation would be grave indeed. Wheat and rice and other cereals may just be adequate but at a huge cost in additional irrigation and in the use of artificial fertilizer, for which imported oil may be needed. If oil prices continue to rise no one knows how enough cereals can be grown.

Of course, food has to be cooked before it is eaten, and today more than half of India's cooking is done on *chulas* using cowdung, twigs or firewood. The price of firewood has also been rising. Unless the Forest Departments allow more felling of trees, firewood will soon be too costly for villagers. (Kerosene or cooking gas is even more expensive and in short supply). But

even at the present rate of extraction, our forests are getting reduced year by year. They do not grow as fast as they are cut down. One calculation shows that by 2000 A.D. we will need to cut down for firewood, every year, trees equal to half our present forests! This is obviously impossible and makes one stop and think.

Housing

The figure shows how short we are of houses today and assuming one housing unit is needed for each family of five, how the shortage is likely to continue till 2000. Today we are trying to build cement-concrete blocks in every city to give one-room or two-room tenements to the average man. But these cost about Rs. 15,000 each, and this approach can never provide shelter for the millions who need it, even if that much cement were available. The answer can lie only in simple, self-help housing when people live in small towns or in townships connected to bigger cities. Every family has spare hands. In wooded areas like Assam it is taken for granted you build your own neat house from wooden columns and bam-



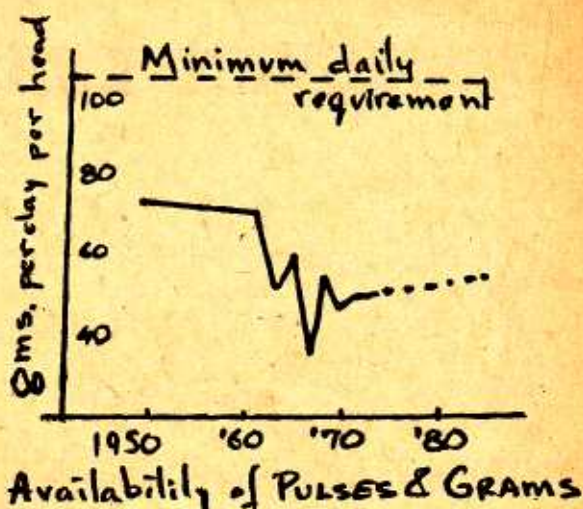
boo-splint walls, covered with mud plaster, with a thatch roof. Such housing can be renewed every year at hardly any cost, and is clean and spacious to boot!

Other Resources

Minerals are the basis of much of our industry. Will India's mineral reserves last till 2000 A.D.? Fortunately, the answer is YES for the important minerals like Iron Ore, Coal, Limestone and Bauxite, from which Aluminium is made. The National Geophysical Research Institute has calculated the number of years our reserves will last assuming different rates of growth for their consumption. Since population is growing at 3% per annum, a 5% rate of growth in mineral consumption seems reasonable. But at that rate our Bauxite will be exhausted by 2008 and Chromite will have been exhausted by 1997. India must already import many other strategic materials like lead, copper, platinum, tin, silver and zinc. It may be difficult to import these in future as these resources are becoming scarce throughout the world. Since poor as we are, we can hardly reduce their consumption, that means we must find alternative materials to do their work.

A Hopeful Scenario for 2000

We have painted a dark picture above of the likely future *per capita* availability of food, housing and minerals. In last month's issue we discussed how pitifully little energy per head we utilize even now and how conventional sources are highly expensive. But if only it were possible to assume that our population was lower in 2000 A.D.—say 900 million instead of 1000 million—then things would look much brighter. There would be 11% more of everything to share. What would have been used up to feed and shelter the extra 100 million persons could now be used to give a better life to the remaining 900 million. If you realise that a typical pupil attending school



in Bombay consumes (in food, clothes, books, furniture, toys, entertainment, holidays) about ten or twenty times as much in a year as is available to a pupil in a village school, you will understand how much better off the country would be if the population did not grow so fast, especially in the cities.

Let us see how the future might look in 2000 A.D. if the population is kept to around 900 million. Food habits would have changed to include a lot of pre-cooked foods bought ready-made and warmed in solar heaters before eating. Unconventional sources of food will be used, like algae grown in ponds and hydroponic gardens where vegetables grow in sand trays fed with nutrient-rich waste water.

Solar energy would be stored and used at least for heating so that many facilities like schools, community centres and libraries will be used at night as well as day time. Children, at birth, will be given educational coupons entitling them to 21 years of free education, taken as and when they like so that they can mix school, travel and work all through their lives. The major subjects of research will not be physics, chemistry and engineering but 'life sciences' like zoology and botany because in future, wealth will come from exploiting living nature—

15

SEVEN YEARS IN TIBET

(Part 2)

by HEINRICH HARRER

WHEN it was fully light I hid myself although the country showed no trace of human habitation. I knew that before reaching the Tibetan frontier I should come to the village Nelag at the other side of which lay freedom. So I marched on care-free, the next night even after daylight had come. That was my undoing. As I came round a heap of boulders, I found myself right in front of a swarm of gesticulating people—my pursuers had caught up with me. I was at once surrounded and summoned to surrender. . . .

The return journey seemed a pleasure trip. I did not have to carry a pack and was very well looked after. On the way I met Marchese who was staying as a guest with the forest-officer in his private bungalow and was invited to join them. Imagine my astonishment when, a few days later, two other escaped members of our company in the P.O.W. camp were brought in: Peter Aufschnaiter, my comrade on the Nanga Parbat expedition, and a certain Father Calenberg.

Meanwhile I had begun plans for escaping once more. I made friends with an Indian guard who cooked for us. I handed him my compass and my money, as I knew that it would be impossible to smuggle these things into camp. I told the Indian that I would come next May to collect my possessions from him.

Back in the camp, I again became busy with my preparations. The winter passed swiftly and by the next 'escape season' I was well equipped. I had not counted on getting back the kit I had left with the Indian. So I supplied myself afresh with the things I most needed. A touching proof

The Story So far:

In 1939 Heinrich Harrer, the well known Austrian mountaineer, had just completed his first expedition to Nanga Parbat in the Himalayas, when World War II broke out. His whole team was arrested and sent to the large Prisoner-of-War Camp in Dehra Dun.

With the snow-covered mountains so close and alluring to his mountaineering spirit, Harrer built up his strength for an escape over the Himalayan passes to Tibet. He did exercises and slept in the open, while at the same time learning Hindustani, Tibetan and Japanese.

Marchese, an Italian General, teamed up with Harrer in breaking out of the camp in April 1944. Once out of the camp, they travelled only by night to escape observation. More than a fortnight after their escape, they had just left the temple town of Uttar Kashi, when they were caught by Indian soldiers and taken to a bungalow for the night. Marchese was by this time totally exhausted, but Harrer, determined to be free again, jumped out of a window while the sentries were having their dinner.

of comradeship was the generosity of my companions who, hard up as many of them were, spent their money freely in contributing to my outfit.

Our zero hour was 2 p.m. on April 29th, 1944. We were disguised as a barbed wire repairing squad, since such working parties were a normal sight. They consisted of Indians with an English overseer.

At the appointed time we met in a little hut in the neighbourhood of one of the least closely watched wire corridors. Here make-up experts from the camp transformed us into Indians. Have and Maneger got English officers' uniforms. We 'Indians' had



A 'valley' over 16,000 ft. high in the upper Himalayas, with an ice lake in the foreground and a 24,000 ft. peak in the background. Small tents made of yak-hide provide protection against the cruel cold wind, and yak-dung is the only fuel.

our heads shaved and put on turbans. Serious as the situation was, we could not help laughing when we looked at one another. Two of us carried a ladder, which had been conveyed the night before to an unguarded spot in the wire fencing. We had also wangled a long roll of barbed-wire and hung it on a post. Our belongings were stowed away under our white robes and in bundles, which did not look odd, as Indians always carry things around with them. Our two 'British Officers' behaved very realistically. They carried rolls with blue-prints under their arms and swung their swagger-canes. We had already made a breach in the fence through which we now slipped one after another into the unguarded passage which separated the different sections of the camp. From here it was about three hundred yards to the main gate. We attracted no attention and only stopped once, when the sergeant-major rode by the main gate on his bicycle. Our 'officers' chose that

moment to inspect the wire closely. After that we passed out through the gate without causing the guards to bat an eyelid. It was comforting to see them saluting smartly and obviously suspicious of nobody.

As soon as we were out of sight of the guards, we vanished into the bush and got rid of our disguises, and in a few words bade each other goodbye. I chose the same route as last time, and travelled as fast as I could in order to put as long a distance as possible between me and the camp by the next morning.

At length I came to the farmhouse of my Indian friend to whom I had, in the previous year, entrusted my money and effects. I hid myself in the darkness of the stable and twice softly called my friend's name. The door was flung open and out rushed my friend. He threw himself on the ground and kissed my feet. Then he led me to a room lying apart from the house, in which was a wooden chest with all my things carefully sewn up in cotton bags. Deeply touched by his loyalty, I unpacked everything and gave him a reward. I asked him to get me provisions and a woollen blanket before the following night. He promised to do this and, in addition, made me a present of a pair of hand-woven woolen drawers and a shawl.

I had already been on the march for ten days when I reached the village of Nelang, where last year destiny had wrecked my hopes. This time I was a month earlier and the village was still uninhabited. But what was my delight to find there my four comrades from the camp! They had overtaken me when I was staying with my Indian friend. My friend Kopp, who in the previous year had penetrated into Tibet by this route, joined me as a partner.

At last on May 17th, 1944, we stood at the top of Tsang-chokla pass, so long the object of our wishful dreams, for here no Englishman could arrest us.

Before noon next day we reached our first Tibetan village, Kasapuling, which had six houses. The villagers hardly deigned to glance on us. Since Tibet has no frontier posts, the whole population is brought up to be hostile to foreigners, and there are severe penalties for any Tibetan who sells anything to a foreigner. We were starving and had no choice but to threaten to take one of their animals by force if they would not freely sell us one—and as none of the four of us looked a weakling, this method of argument eventually succeeded. Finally, for a shamelessly high price they sold us the oldest billy-goat they could put their hands on. We slaughtered the goat in a stable and it was not till midnight that we fell to on the half-cooked meat.

For three weeks we wandered through Tibet, from one minor official to another. We eventually learned from bitter experience that life in Tibet without a residence permit was not possible.

We were all of us convinced by this time that we had to approach some higher authority in Gartok, the capital of Western Tibet, which was the seat of the Governor of the region. It was also known to be the highest town in the world.

When, however, we finally set eyes on this famous place we could hardly help laughing. The first things we saw were a few nomads' tents scattered about the immense plain, then we caught sight of a few mud-brick huts. That was Gartok. We learned that the two high officials were away, but were expected to return in a few days. So we pitched our little tent on the bank of the Gartang-Chu, a tributary of the Indus, and decided to wait.

One morning we heard the sound of bells in the distance as a huge mule-drawn caravan approached the village. The senior of the two Viceroys, whom they call Garpons in Tibet, was arriving. He and his wife wore splendid silk robes and carried pistols

in their girdles. The whole village assembled to see the spectacle. Immediately after arriving, the Garpon moved in solemn procession into the monastery to give thanks to the gods for his safe return from the pilgrimage.

Aufschnaiter composed a short letter begging for our audience. As no answer came, we set out in the late afternoon to visit the Garpon. He is a high official who is invested for the duration of his mission with the fourth rank in the hierarchy of the nobles of the fifth, sixth and seventh rank. In Lhasa he is reduced to the fifth rank. All the nobles in Tibet are ranked in seven classes, to the first of which only the Dalai Lama belongs. All secular officials wear their hair piled up on their heads; monks are shaven and the ordinary people wear pigtails.

At last we came into the presence of this potentate. We explained our case to him in all its details and he listened to us with friendly patience. Often he could not refrain from smiling at our defective Tibetan, while his retainers laughed out loud. This merriment added a spice to the conversation and created a friendly atmosphere. The Garpon promised to consider our case carefully. At the end of the audience we were hospitably entertained and received tea made in the European fashion. Afterwards he sent presents to our tents and we began to hope for a happy issue.

After three days our *travel pass* was delivered to us. It stipulated that our route should pass through the following places—Nykhyu, Sersok, Montse, Barkha, Tokchen, Llolung, Shamsang, Truksum and Gya-bnak. It was also laid down that we had the right to requisition two yaks. A very important clause required the inhabitants to sell us provisions at the local prices, and to give us free fuel and servants for the evenings.

TELECOMMUNICATIONS TODAY

IN a year's time villagers in Krishna District of Andhra Pradesh will have the facility of automatic long-distance dialling. The Rural Dialling Scheme, as this is called, for which special equipment has been designed by the Telecommunication Research Centre, New Delhi, will enable farmers to learn today's market prices for their produce and bargain on equal terms with the urban merchants. They can also get technical assistance quickly if they need it for electrical pumps or mechanical equipment like tractors and threshers. This will encourage them to take up high yielding seeds and modern methods of farming. Better phone service in rural areas will make possible rural industries, too.

This is just one example of how far telephone communication services have advanced since the invention of the telephone only 100 years ago. We could hardly do without it today. And in future it is believed it may take the place of many postal services...

Alexander Graham Bell was born in 1847 in Edinburgh, and was from the beginning interested in science. His father was a teacher of the dumb, and so young Bell studied anatomy and the physiology of speech in London. In 1871 the family moved to America where Bell soon became a famous teacher of the deaf and dumb in Boston. To enable deaf mutes to learn to speak more easily, he was determined to find some way of making speech visible. He wanted to enable them to see the vibrations or movements made by different human tones (which they could not hear, of course) so that they could imitate them and thus learn to speak properly. So he tried to devise an electrical apparatus which would record the vibrations of sound. The ordi-

The Telephone, such an indispensable instrument today, was invented and patented by Alexander Bell a 100 years ago. It was the starting point of the tremendous advances in telecommunications that have followed since then.

nary Morse telegraph had already been invented and was in wide use at the time.

He began his experiments by trying to invent a harmonic telegraph, in which various electric currents would vibrate thin reeds made of metal, in order to produce different sounds. Through an accident, he discovered that when one of the springs was plucked, it would change its vibrations into electrical current which would produce the same vibration in a receiver at the other end of a hook-up. Bell's next step was to arrange a diaphragm over the end of his spring in order to make a mouthpiece.

On March 10, 1876, Thomas A. Watson, Bell's assistant, became the first person ever to hear words spoken over a telephone. Bell and Watson, at the time, were testing a crude telephone transmitter. Watson was waiting for the test message at the end of a wire in another room. Suddenly, Bell upset a battery, spilling the battery solution on his clothes. He called out impulsively, "Mr. Watson, come here. I want you!"

Watson rushed into the room and shouted, "Mr. Bell, I heard every word you said—distinctly." The telephone had worked! The damage to Bell's clothes was forgotten.

The receiver and transmitter of Bell's first telephone could be used interchangeably and therefore it provided two-way conversation, but one at a time. He exhibited his

instrument at the Centennial Exposition at Philadelphia in June, 1876. The public at first showed little interest but scientists greeted it with enthusiasm.

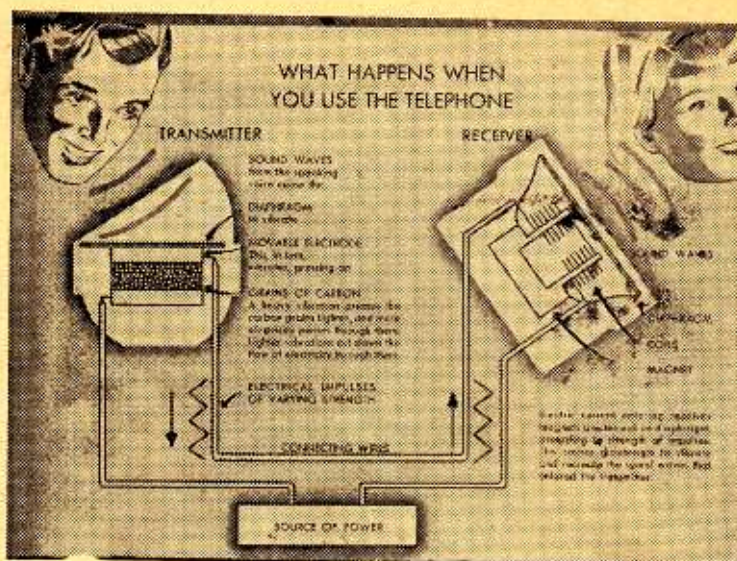
Bell was granted his patent on March 7, 1876: On the same day that Bell made his application of a patent, Elisha Gray, a professor at Oberlin College, also submitted a claim for a patent. Gray had succeeded in inventing the musical telegraph that had been the original object of Bell's research.

Other persons, who claimed to have invented the telephone, also put in a appearance. The confusion over patents was finally settled by the law courts, but not until Bell had successfully defended more than 600 separate law suits!

The first money ever paid as rental for the commercial use of a telephone was paid in May 1877. By August that year, about 800 telephones were in use. Today, the successor to the company Bell founded is known as the American Telephone & Telegraph Company, and it provides over 100 million telephones in the U.S.A.!

Later Improvements

Numerous improvements and new developments have made possible the extension of telephone service over longer distances. The most important has been the distance use of microwave or very high frequency (VHF) radio waves to carry many different telephone currents at the same time. The currents are amplified along the route and are sorted out at the receiving end by electronic circuits. Radio relay uses very short microwaves, which are beamed from one relay station, mounted on a tower, to the



next. Since the microwaves move in a straight line, the signal will be lost unless the stations are fairly close to each other—usually about twenty-five or thirty miles apart.

The *coaxial cable* is a telephone pipe-line in which pipes, called coaxials, are employed. A single coaxial unit consists of a copper tube about the size of your little finger. Down the centre of each tube runs a single copper wire a little thicker than pencil lead. The wire is held in place by small disc of insulating material. The cable is called coaxial because the copper wire and the copper tube have the same axis. Most coaxial cables contain eight tubes side by side which can transmit simultaneously electrical impulses having a wide variation of frequencies.

The Satellite Era

Space satellites have made possible much greater advancement — easier and faster transmissions. This possibility was first demonstrated by NASA, using the balloon reflector satellite, ECHO, in 1960. Two years later, a further advance was made by carrying 600 voice or data channels (or a single

T.V. signal) through the TELSTAR satellite across the Atlantic. Signals were beamed to and from TELSTAR on high-frequency waves—which covered a wide band of frequencies like radio waves. Today the Intelsat Corporation operates four communication satellites providing international links between all continents. Many countries—the U.S.A., U.S.S.R., France, Australia, Canada, Indonesia—have their own national satellite hovering overhead for domestic communication services.

In our own country, a satellite Earth Station was put up in 1971 at Arvi, near Poona. It utilises the Indian Ocean satellite, *Intelsat III* (launched by NASA in 1969) for receiving and transmitting signals to Europe and U.S.A. (India was one of the 77 member-countries to utilise this facility.) This earth station picks up all the messages meant for India, amplifies them and transmits them to the overseas telephone office in Bombay. Similarly, Bombay can send messages to other countries. The signals are taken by the micro-wave from Bombay, converted at Arvi to the satellite frequency band, then amplified and sent by the huge dish antenna of the Arvi station to the satellite. The satellite beams them back down to Europe, Africa and Australia.

Tele-Photographs

You often see in the newspapers "wire photo" of a distant event printed immediately. This is another extension of the telephone service. Instead of sending a single photograph from one place to another, some newspapers send the whole page of a newspaper from the main editorial and printing office to another town where another edition is printed from the received picture. One of the pioneers in this is the HINDU of Madras. Our readers in Tamil Nadu and Karnataka should pay a visit to the HINDU to see how this works.

Computers and Telecommunications

In the last ten years, developments in the computer field have been very rapid. Linking up of computers by telephone lines is already common. Similarly, humans can converse from an electric typewriter with a computer which may be in the next room—or on the next continent. In many big business and government offices today all the internal messages are typed into the central computer which stores them and shows them on a T.V. screen at the office to which they are addressed. No need for paper or messengers! We wonder if Alexander Graham Bell, the kindly teacher of deaf mutes, dreamt of this as he messed about with batteries and wires a hundred years ago.



9 (INDIA IN 2000 A.D.)

trees and plants and animals—not merely minerals.

Though paper and books would still be used, most communications will go by wire or wireless using electronics. Small Computers and visual TV-like screens will be commonplace, available like a telephone in every building, and serving as a combination postal system and library of information.

Much more attention would be given to developing a wholesome, happy and sharing life among small colonies, equivalent to our housing societies, and these colonies would be the unit of civic life. Parks and gardens would be planted with new dwarf trees bearing fruit and vegetables.

This is just hopeful speculation, of course. So much will depend upon whether the population of India can be contained, on how hard and efficiently we work and on how fairly the benefits are distributed. Each one of us must do his share.





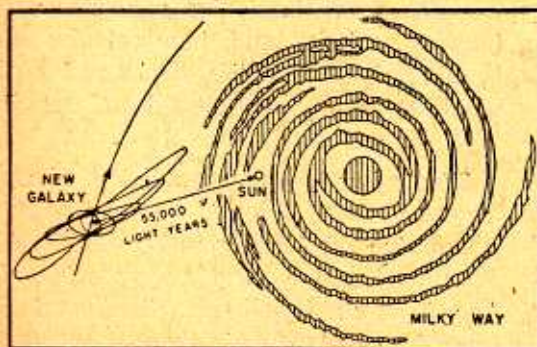
SCIENCE NEWS AND NOTES

For Weight Watchers only

Any excess food eaten by fat people is stored in their bodies as fat. But, it seems, there are certain periods in one's life during which fat cells are deposited. At other times, more lean tissue or muscle is formed. The critical "fat" periods are now pinpointed in three phases: in the first year of life; between the ages of 6 and 10 years; finally, at 17 years of age. These are, therefore, the times when boys and girls tending to fatness should be most careful about their diet.

The Milky Way's Nearest Neighbour

Light from the Sun takes eight minutes to reach the Earth. Alpha Centauri, the star nearest to the solar system, is four light years away. It is well inside the Milky Way. The two galaxies nearest to the



Milky Way were thought to be the two Magellanic Clouds, 180,000 and 200,000 light years away. But a tiny neighbour, only 55,000 light years away from the Sun, has just been found. It is so close that it appears to touch the Milky Way.

The discovery came after some strange dots were noted in the "hydrogen maps" of the constellation Gemini. Clouds of hydrogen in space emit radio waves which can be detected and plotted on star maps. A computer worked out "this funny thing on the maps" as a dwarf galaxy whose shape is being torn and distorted by the gravitational field of the Milky Way which is one thousand times more massive.

A Three-In-One Compass

An English manufacturing company has devised a three-in-one safety compass. Made of hardwearing moulded plastics, this compact, easy-to-use instrument for students and teachers performs the functions of a compass, a protractor and a ruler. It is shaped simply like a flat ruler, about 14 cms long and $2\frac{1}{2}$ cms wide. It has no spike or sharp edges.

The *Triman Safety Compass*, as this instrument is called, can be employed to draw circles of radius from 1.3 cms to 11 cms as well as to draw angles or straight lines. For drawing circles, it has a small, freely rotating plastic disc at one end. This disc, which also serves as magnifier, is pressed on to paper with the thumb; then the rest of the instrument swings around it. The required radius is set by adjusting a screw-in pencil holder.

Are you a Subscriber?

Only a subscriber can score points in our quizzes, contests, By You's, etc. Points are converted into prizes every August.

A quiz on

India's Neighbours

I. Which of the following neighbouring countries has an assembly today directly elected by the people?

1. Afghanistan 2. Pakistan 3. Nepal 4. Tibet 5. Bangladesh 6. Burma

II. Name the chief person of each of the above governments.

III. Mention two important products of each of the above countries.

IV. Give one example each of India's special relations with the above countries.

V. Match each country listed below with the right area from column 2 and the population from column 3:

COUNTRY	Area (Sq. Mi.)	Population
1. Afghanistan	(a) 54,500	(A) 13 million
2. Sri Lanka	(b) 250,000	(B) 11 million
3. Burma	(c) 54,000	(C) 28 million
4. Nepal	(d) 261,800	(D) 16 million
5. Bangladesh	(e) 25,330	(E) 64 million

VI. In which country (a) did a foreign attack cause the ruler to flee to India? (b) did the Prime Minister take over dictatorial powers last year? (c) has oil or gas been found? (d) are there many settlers now returning to India?

VII. Where are the following located?

1. Galle Sea Face 2. Shalamar Gardens 3. Golden-roofed Pashupati 4. Shwedagon Pagoda 5. 80-ft Standing Buddha.

VIII. Say whether the following statements are *true* or *false*. If you think a statement is false, give your reason.

1. Buddhism in Sri Lanka and Burma is different from that practised in Tibet.

2. Afghanistan was part of the British Empire.

3. The Tibetan people are Chinese by race.

4. If Nepal develops her rivers for hydro power, it will benefit India.

Send your answers to these questions on an independent sheet, mentioning clearly your name and SR Number. Up to 5 points will be awarded on merit. Last Date: MARCH 15

7 (BENJAMIN FRANKLIN)

Question: "Is there no means of obliging them (the Colonies) to erase the Resolutions (which they had passed against the Stamp Act)?"

Franklin: "None that I know of; they will never do it unless compelled by force of arms."

Question: "Is there a power on earth that can force them to erase them?"

Franklin: "No power, how great soever, can force men to change their opinions."

The Stamp Act was defeated, but relations between the mother country and the Colonies did not improve, and by 1775 Franklin feared arrest for treason if he did not depart from England at once.

Back in Philadelphia he entered upon a new career as midwife for a nation. Recognising his genius, Congress placed him

on several Committees. Finally, to this 70-year-young man was given the crucial task of going to Paris to win French aid.

In Paris, Franklin found an ally in France's foreign Minister. The Count de Vergennes saw a chance of humiliating England and at the same time trading freely with an independent America. He quickly set up a dummy trading company to channel military supplies secretly to the Americans. American independence owes not a little to these arms and munitions and, later, to the seasoned French troops under Lafayette who fought alongside General Washington's tattered battalions.

Franklin meanwhile negotiated loans and accepted gifts from sympathetic Frenchmen. He gave letters of authority to privateers (i.e. pirates operating under the American

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HOW TO FACE YOUR EXAMS

by G. S. KRISHNAYYA

Thousands of you will be sitting for your examinations within the next few weeks. Since examination are unavoidable, it is desirable that you should be well-prepared for them. But that is not enough. Not less important is it to know how to face examinations and to answer examination papers satisfactorily. Here are some useful hints:—

1. Form Good Study Habits

Preparing for an exam. calls for good classwork and homework. Therefore, form good study habits. Listen carefully in the class and keep a neat note book handy to jot down carefully the chief ideas. Study takes time—there are no substitutes. Have a special place for your study—away from distractions, family gatherings, radio and the like. At this mental workshop, keep all your tools ready at hand.

2. Make a Chart for Your Work

Make a chart for the different subjects that will enable you to cover the ground thoroughly before the exam. Work your plan and reach your targets daily before retiring. See what questions have been set during at least the previous 5 years to realize what can be asked in a particular subject. Answer old question papers and have your answers corrected.

3. Build up Routine and Stick to It

Make a time-table including in it not only preparation but leisure-time reading, recreation and sociability. Stick to your schedule. Your habits can be your foes or your friends—now and later. Present pleasure should not blind you to permanent profit. Students who work hard need not get panicky and strain themselves at the end.

4. Don't Work to the Point of Fatigue

A number of students work most of the previous night, have a scanty, hurried breakfast, and keep studying until it is time to enter the hall. The mind, not being a machine, can work only up to a point at a certain speed. If the mind is to retain what it has taken in, it must be given time to digest and assimilate.

5. Take with You All that Is Necessary

Keep ready on the previous evening everything that you will need. An ink bottle, a new eraser, an extra pen, a spare pencil, all may come in handy. Most important is a watch which will run and perhaps also a cycle which will go.

6. Don't Get Nervous or Diffident

Half the battle lies here. Your success in keeping cool will determine your success in doing justice to yourself. One way to ensure this is to try to be in the examination hall ten or fifteen minutes before time. If you come to the examination in good time, and fresh in body and mind as suggested earlier, you will not easily get upset or excited.

7. Follow the Instructions

The first thing you should do in the hall is to read what is printed on your answer book and supply all the information wanted. This must be done before you receive the question paper. Every year many papers are found without the number of the candidate and the title and part of the subject.

8. Read the Whole Paper in the Beginning

Read carefully the directions printed at the top of the list of questions. Note the time allotted for the paper and the number of questions to be attempted altogether, and in the different sections. Read *all* the questions before beginning to answer the paper—turning the page over.

9. Budget Your Time First

If all the questions should carry equal marks and you have eight questions to answer in a three-hour paper, you would do well to spend 20 minutes on each answer; give the first five minutes to outlining and planning of the answer and reserve about 15 minutes for revision of the answers.

10. Don't Start an Answer till You have Got the Point of the Question

Much time and energy is often wasted because candidates, recognising some familiar or expected word or phrase in the question, dash off page after page only to discover to their utter disgust at the end that it was irrelevant! Therefore look for the *point* of the question.

11. Don't Omit a Question

One rarely gets full marks for a perfect answer. In fact, no answer ever seems perfect! You can be more sure of getting half marks for a half answer than full marks for a full answer. Two halves are equal to more than one—in marks fetching!

12. Re-read the Questions and the Answers at the end

First go over the questions and then take up the answers. Half an hour spent on revision may mean more than that time spent on writing. You could use this time also to make your answers look presentable, wherever it is appropriate, with sectional headings, paragraph titles, underlining and outline and summaries.

13. Don't Forget the Value of Legibility, Neatness and System

It is of the utmost importance that what you take the trouble to write should be easily readable. The examiner, you must remember, is human, with patience which gets exhausted when answers in hundreds of hurriedly written papers have to be scrutinized in a short space of time. Also try and introduce some plan and system into your answer, and make the arrangement evident. Make your points and headings stand out.

Secret: Knowledge and Presentation

Finally remember that what is worth doing is worth doing well. You have no one to blame but yourself if you don't get the marks you expect. Remember that passing well, or, for that matter, passing at all, depends not merely on knowing the subject, but on exhibiting your knowledge to the best advantage in your answer paper under examination conditions. **GOOD LUCK!**

~~~~~

### 17 🖋️ (BENJAMIN FRANKLIN)

flag) to attack British ships, then served as judge for the sale of the captured goods. He even plotted an invasion of Scotland! All the time he waited for good news from the battlefield where the tough British "red-coats" made mincemeat of the raw American volunteers. One day, a messenger arrived with the astonishing news, "General Burgoyne and his whole army are prisoners of war!" It was December 4, 1777. This was a great turning point, though the war dragged on for several more years. But for Franklin the long hard work of negotiating the peace had begun.

Give us Canada, Franklin demanded of the British, as his initial bargaining position. He settled for borders on the West at the Mississippi, and on the North at the St. Lawrence, and for fishing rights off Newfoundland.

🖋️ 30



**NATION ON THE MOVE**

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# Puzzles and Pastimes

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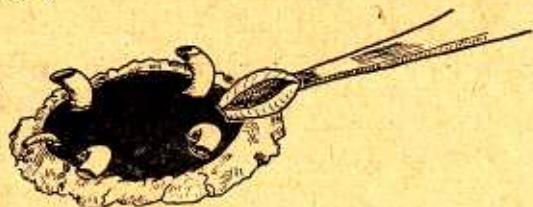
|               |     |                 |
|---------------|-----|-----------------|
| Feline story  | ... | Cat tail        |
| Witch         | ... | Flying sorcerer |
| Water canteen | ... | Thirst aid kit. |
| Golfer        | ... | Tee totaller    |
| Gossip        | ... | Ear pollution   |

## FLOATING TURTLES

Take a piece of aluminum foil. Crush it. Then straighten it again. Now cover the inside of a spoon with the foil.

Melt candle wax over hot water. Add a piece of green or brown crayon to colour the wax. Pour into the spoon. This makes the turtle's shell.

For neck, legs, tail, and head, dip bits of macaroni, noodles, or spaghetti into the wax. Set them in place before the wax hardens. A piece of shell macaroni makes a good head.



Make several different sizes of turtles by using different sized spoons. Your turtle will float. You can make them race by squeezing air on them with empty plastic bottles.

## RIDDLES

1. Why do dragons sleep in the daytime?
2. What has a thousand needles but does not stitch?
3. Who can jump higher than the kitchen table?
4. Why is a trap like the measles?
5. What goes through a door, but never goes in or out?

## NEW WORDS FOR OLD!

A mere change in the order of the letters in a word can produce a new word. On the left side below are a few such words. Change the order in each and get the right new word to match with the new meaning to its right.

1. Inch ..... to a part of the face
2. Ape ..... to a vegetable
3. Balm ..... to a baby sheep
4. Yam ... to the fifth month of the year
5. Lean ..... to a path
6. Wand ..... to the break of the day
7. Keen ..... to a part of the leg
8. Flea ..... to a part of a tree

## WHAT DO YOU HAVE?

What do *you* have that spells PINES? That's SPINE. What do you have that spells slip? That's LIPS. Another *part of the body*.

1. What do you have that spells MARS?
2. What do you have that spells ONES?
3. What do you have that spell SEAR?
4. What do you have that spells LOSES?
5. What do you have that spells EARTH?
6. What do you have that spell LAMPS?
7. What do you have that spell SHIP?
8. What do you have <sup>that</sup> spell VINES?
9. What do you have that spell SLID?
10. What do you have that spell SNAIL?

(Answers on P. 23)



# Hallabau's

## Jealousy

*A Nigerian Legend*



A LONG time ago, there lived a man who had two sons. Although he was very fond of the boys, he longed for a daughter, so that when one day his wife had a baby girl, he was filled with joy.

Nothing he could do for the baby was too much trouble. Whenever he went to market he would bring her back sweetmeats or gaily-coloured beads. Nor would he allow the girl, when she was older, to be sent to the bush with the other children to collect wood and water, although her brothers always had to do their share of the hard work.

Now her two brothers, Hallabau and Shadusa, grew jealous of the way in which their father treated them, and Hallabau, the first-born, often lay awake at night, making plans to get rid of his sister.

One morning, when the girl was about ten years old, Hallabau turned to his sister and said gently:

'Come with us to the forest, and help us gather wood. You will make our task much lighter.' The girl was flattered because her brothers sought her company, and rising to her feet she followed them out of the compound and into the dark, shady forest.

After they collected a large bundle of wood, Hallabau turned to his brother and said, 'Take this bundle of wood to the forest, Shadusa, and then return for another bundle which we will have ready for you.'

Shadusa did as he was told, and immediately Hallabau seized his sister and flung her over his shoulder.

'Let me go! Let me go!' she screamed, but he took no notice and began to climb up a tall mahogany tree until he reached a thick branch, well hidden by leaves. Pulling a bundle of strong creepers from under his clothing, her cruel brother bound her to the branch of the tree so tightly that she could not move.

Hallabau speedily climbed down the tree and ran to meet Shadusa who was returning for more wood.

'Alas!' called Hallabau. 'I have lost our sister. Come and help me find her or our father will be angry! She went this way,' said the wicked boy, pointing in the opposite direction from the tree where he had bound his sister.

The two brothers searched for several hours, and finally took the bad news to their father. He was angry with them and made them search again the next day and the next, but soon his anger turned to grief and he sadly realized that his daughter was lost for ever.

But what of the poor girl? Towards evening she heard the sound of men's voices. Looking down, she saw a caravan of traders each driving several donkeys loaded with large bags of kola nuts.

Twisting her head uncomfortably, so that



they could hear her, the girl sang:

*'Oh, do you know my brother?  
Have you heard of Hallabau?  
I wish I had never met him.  
O somebody save me, please!'*

The men stopped in their tracks. 'It sounds like a young maid,' said the leader of the caravan, and he began to climb up the mahogany tree.

'Are you a maiden, or are you a spirit?', he asked as he loosened the girl's bands.

'O sir!' exclaimed the girl, 'I am a poor maiden whose jealous brother wants to kill me.'

Now he was a rich and kind man who had no children of his own, and when he saw beautiful the girl was he said: 'Come home with me, otherwise your brother will try to kill you again. From now on, you shall be my daughter.' So the girl lived with the man and his wife for many years, growing even more beautiful as time went by.

Her fame had reached even the small village where Hallabau lived, and he decided to take gifts and ask for her in marriage.

First the trader talked with Hallabau and satisfied himself that he was a young man worthy to be the husband of his beautiful daughter. Then the girl was brought, and Hallabau found himself speechless in the face of such beauty. The girl, too, was attracted by the young man's good looks, but as soon as he spoke, she recognized him for what he was—her elder brother!

She said nothing. Bidding the kindly couple farewell, she set off with Hallabau, speaking scarcely at all; but the young man assumed that she was shy and thought nothing of it.

Her real parents did not recognise her, but greeted her with open arms and began to make preparations for the wedding.

That evening, alone in the compound, the girl began to sing sweetly:

*'How can I marry my brother?  
How can my father be told?  
Will even my mother believe me?  
Oh, how can I prove who I am?'*

Hallabau's parents were curious. They hid behind the mat fence and listened.

'Surely she cannot be our long-lost daughter?' said the father.

'From the first, I thought there was something familiar about her face,' replied the mother.


'Well, we can easily prove the matter,' suggested the father. 'Don't you remember that our daughter had a big birthmark on her right arm?'

'Of course!' exclaimed the mother. 'Let us go and ask the maiden about it now.'

The parents excitedly went to where the girl was singing.

'May we see your right arm? We think there is a birthmark there that will prove you are our own daughter.'

Then followed such rejoicing as had not been seen in the village for a long time. Fires were lit and delicious food was cooked; drummers were summoned and everyone danced for joy.

But the wicked brother Hallabau was so ashamed of himself that taking his bow and arrow he quietly disappeared in the night and was never heard of again. 

#### ANSWERS TO PUZZLES

##### RIDDLES

1. They hunt knights. 2. A porcupine. 3. Anybody can, because the table can't jump. 4. Because both are catching. 5. A keyhole. 6. Because it's a bawl-room. 7. Two porcupines. 8. A safe robbery. 9. When he is turned into a pen. 10. Because its seats are always in tiers.

##### NEW WORDS FOR OLD

1. Chin 2. Pea 3. Lamb 4. May 5. Lane 6. Dawn 7. Knee 8. Leaf.

##### WHAT DO YOU HAVE?

1. Arms 2. Nose 3. Ears 4. Soles 5. Heart 6. Palms 7. Hips 8. Veins 9. Lids 10. Nails.



*Many of you have already enjoyed amusing and often, hilarious adventures in Greece and England with Gerald Durrell—that master writer of animal stories. This is an extract from *Two In the Bush* which is a record of a six-month journey that Durrell took with his wife, Jacquie and two cameramen, Chris and Jim through New Zealand, Australia and Malaya. They were there to see what was being done about conservation of rare birds and animals in these countries, and to make a series of films for the BBC. Let's overtake them in Australia and follow them to the lair of the Lyrebird—Sherwood Forest.*

## Spotty's Dancehall

Gerald Durrell

WE all fell in love with Australia completely and instantly. If ever I was compelled to settle down in one spot, Australia is one of the few countries I have visited that I would choose.

We drove down from Sydney to Melbourne under a brilliant blue sky striped with fragile wisps of cloud. The countryside was rolling, sun-bleached grassland, with here and there the rust-red earth showing through. Dotted about were copses of eucalyptus trees—beautiful and graceful trees that manage to contort their trunks and limbs into the most incredible postures, so that they look as though they are taking part in some fantastic ballet.

One of the things that we were most anxious to see and to film, if possible, was the Lyrebird. It is one of the most spectacular of the Australian birds, and I knew that the Wildlife Department of Melbourne had created a sanctuary for them at a place called Sherwood Forest. We were under the capable guidance of Miss Ira Watson, who had been doing studies on the birds and knew the area intimately. Ira had booked rooms for us at a small hotel situated on the edge of the Lyrebird sanctuary, so early one cold, misty morning, we set off with our mountain of equipment, in search of Lyrebirds.

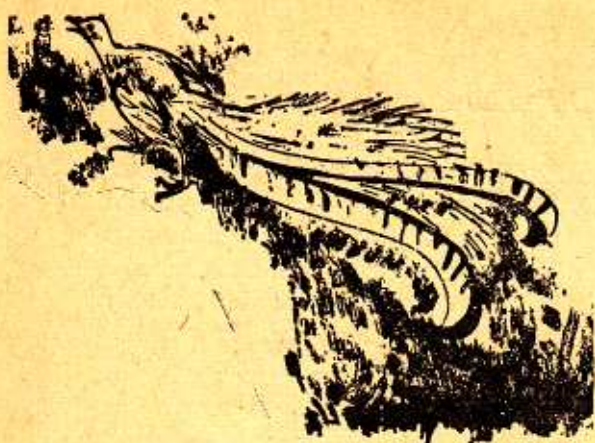
The whole forest was gloomy and as echoing as a deserted cathedral. Ira took us along a narrow, meandering path which presently

led us out into a sort of wide ride through the forest. The floor of the ride was covered with tree ferns and short vegetation, and here, in a clearing, we piled all the equipment into a heap and then set off to look for the birds.

The Lyrebird is not particularly spectacular to look at, resembling a rather drab hen pheasant. Its beauty lies in its tail, which consists of two long, delicately curved white feathers which curve out and round so that they resemble an ancient lyre. To add verisimilitude to the illusion, the area between these two immense, lyre shaped feathers is criss-crossed with a delicate tracery of fine white feathers that resemble the strings of the lyre. At the beginning of the breeding season the cock birds choose areas in the forest which they convert into dance halls. The area is cleared with the aid of the bird's strong feet, and the leafmould neatly piled up in the centre of the clearing is used as a stage. When this is ready the cock bird can commence his display, and it is probably one of the most spectacular in the world. He is also the most accomplished mimic and incorporates into his repertoire the songs of other birds and any other sounds he hears which take his fancy.

Presently we came upon one of the dancing halls. 'This is one of Old Spotty's halls,' said Ira, 'he's one of the oldest and tamest of the birds here. He's the one I was hoping





we would find because he'd be much easier to film than the others.'

All that afternoon we wandered about the forest trying to find Lyrebirds in a suitable area for photography, but without success. We saw quite a number of them, but they were all lurking in the dimmest recesses of the forest. We returned to the hotel irritated, cold and hungry. On the following morning—a Sunday—the weather had lifted slightly and so we set off into the forest in high hopes. No sooner had we settled down near the dance hall than Old Spotty appeared. However, having appeared, he did absolutely nothing except stand still and stare at us with a vacuous expression for some minutes before disappearing into the forest again. Six times he did this. The seventh time he joined us he walked right up to us, and condescended to eat some cheese, but at the mere suggestion that he should do a display for us he stalked away.

Another hour passed, Chris by now was pacing up and down looking like the Duke of Wellington on the eve of Waterloo, when suddenly two things happened almost simultaneously. There was a burst of Lyrebird song from the forest some three or four hundred yards away, and with a muttered curse Jim leapt to his feet and, grabbing one of the cameras, bounded off into the forest. Hardly had he disappeared than Old Spotty suddenly materialised and made his way determinedly towards his dancing hall.

'Quick, quick', said Chris in agony, grabbing the spare camera, 'you'll have to do the sound recording.'

He rushed through the undergrowth to the edge of dancing hall and started frantically setting up the camera, while I, enveloped in yards of trailing wires, followed him. More by luck than good management, we managed to get set up before Spotty reached us. We were within six feet of the mound, which was the nearest we felt it was safe to go without disturbing the bird. Chris pressed the button, the camera started whirring, and then, as if he had been waiting for this as his cue, the fern fronds parted and Old Spotty stepped into the dancing hall. He paused to give us a regal look and then began his act.

I had expected something spectacular, but Old Spotty's display was so fabulous that I had great difficulty in concentrating on the job of recording. He gave a couple of preliminary, flute-like calls to get his voice in trim and then he slightly lowered his wings, arched his tail right over his back in a shimmering white waterfall of feathers, threw back his head and from his throat poured forth a song that was almost beyond description for purity and virtuosity. Besides trills and flutings and rich deep contralto warbles, I could recognise incorporated into the song the harsh, chattering laughter of a Kookaburra, the sounds of a Whip Bird (like the whistle and crack of a stock whip), and a sound that could only be compared with a tin can full of pebbles being rolled down a rocky slope. Funnily enough, these odd and unmelodious sounds were incorporated into the basic song so cunningly that they enhanced it rather than spoilt it. I had rather cleverly (I thought) hung the microphone within a yard or so of where Old Spotty was singing, but when I looked at the recording machine, I found to my horror that it was in danger of bursting with the volume of sound that was being poured into the microphone. I cautiously lowered my-

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IT WAS MADE TO ORDER:

# BASKETBALL

## HOW IT STARTED

**B**ASKETBALL was the first game to be 'invented' to order. In 1891 the games and athletic instructors of the Y.M.C.A. at Springfield, Massachusetts (U.S.A.) found to their great disappointment that none of the sports adopted from England, Germany, Sweden and France could hold their youngsters' attention, and the membership grew smaller and smaller.

The head of the athletic department asked all his instructors to suggest an exciting type of game which could be played indoors, day or night, and especially in winter when baseball was impossible.

James Naismith, a veteran instructor at the Y.M.C.A. carefully listed the distinctive features of all existing sports. He was convinced the new game had to be a team game and easily learnt and enjoyed by average men and women.

Naismith reasoned that perhaps just a ball should be used, certainly not a stick or bats. A large and light ball, easy to handle but difficult to conceal, seemed ideal. To keep the game moving freely and safely, all tackling was to be banned. The ball could be touched by the hands alone. The winning team had to score a maximum number of throws of the ball into a basket. To encourage individuals skill and initiative, the number of players in each team would be restricted. In 1906 the basket was replaced by open hoops fixed on a pole or board, 10 feet about the ground. This dis-

pensed with the ladder which had been necessary until then to retrieve the ball from the basket! At times, over-enthusiastic spectators tried to do their bit to make their side win. Taking their seat on the balcony, close to the basket, they used their hands, sticks, or even umbrellas. It was to make such unsportsmanlike acts impossible that the backboard was introduced. At first it was only a wire netting, but now it is a wooden board 4 ft. by 6 ft.

*The many benefits of the game soon became clear. It demanded and fostered alert minds and supple bodies. Decisions had to be made quickly, play had to be neat and nimble. It never grew boring, as situations changed all the time and players had to perfect tricks of sudden stopping, feint-passing, and side-stepping. The fact that the ball was mostly up in the air, necessitated frequent stretching and jumping on the part of the players. This was an ideal form of exercise for the growing teenagers.*

So fast was the spread of the game that it was included in the 1936 Olympiad. It is now played in over 100 countries, in many of which it has surpassed the popularity of other 'national' games like soccer or baseball. In India 'netball' was played in girls' schools in the thirties, but basketball was popularised for men after World War II by the Y.M.C.A. P.T. School in Madras. It has yet to achieve the popularity of soccer or hockey, but every year more schools and colleges take it up.

Dribbling





## Playing the Game

There are two teams of 5 players each. The playing court is rectangular—26 m by 14 m. A regulation basketball should bounce 4 feet if dropped from a height of six feet. Each "basket" is a horizontal metal ring 18 inches in diameter, from which hangs a small open net. The ring is mounted 10 feet above the floor and 16 inches out from the back board.

A player cannot carry or hold the ball. He has to throw it to a team mate or keep bouncing it as long as he keeps moving. Once he comes to a standstill, he must im-

mediately pass the ball to a team mate or throw for a basket.

Goals are scored either as *field goals* or as *free throws*. A player scores a field goal when he throws or tips the ball through the basket. His team earns 2 Points for this as against 1 Point for a free throw. A free throw is awarded to a player who has been fouled by an opponent. (Holding, pushing or interfering through physical contact are all fouls.) The referee awards the player one free throw for a minor foul and two throws for a major foul. Free throws are taken from a line 15 feet in front of the basket.

The game is normally played in two halves of 20 minutes each.

## THE SKILLS YOU NEED

Quick and accurate passing is the chief skill required for scoring. Most basic is the *chest pass*. For this, the ball is held in two hands at the chest with the fingers alongside the ball and the thumb behind. Then the ball is passed by fully extending the arms, snapping the wrist and pushing with the fingers. If, however, there is an opponent in the way, a *bounce pass* is made instead, with the same action. The ball is directed towards the ground so that it will skid towards the receiver.

To pass over a long distance, the *one-hand javelin pass* is used. Similar to javelin throwing, the passer takes the ball back behind the head, turns his body and then throws the ball. He follows through with the throwing hand, to ensure maximum accuracy and to avoid spinning of the ball.

## Dribbling

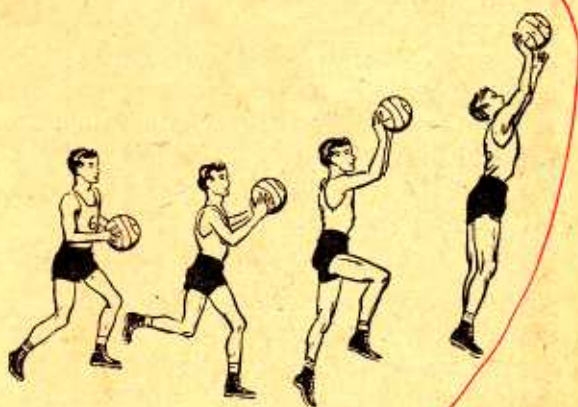
As in passing and shooting, good dribbling is done by the wrist and fingers alone, keeping the palm off the ball. The fingers push the ball down to the ground. Keep the ball low, bend the knees and upper body but keep the head up; dribbling is done by

touch only—you must keep looking at your teammates and opponents.

## Shooting at the Goal

As in other games, scoring a goal is the most thrilling and satisfying part of the game.

Basically, there are three kinds of goal shots. The simplest is the *One-Hand Set Shot*. The player takes up the ball in front of him with both hands and gradually turns the ball to get the right hand behind and slightly under the ball. Then the left hand is withdrawn and the right hand releases the ball from the fingertips with a strong wrist



The Lay-Up Shot *twist on wrist?* 27



action. All this happens as one continuous movement.

An advanced version of the above shot is the *Jump Shot*, usually made immediately after a dribble. The player stops with his feet together, gathers himself and jumps straight up, shooting the ball at the top of the jump, over the heads of the defenders. If he was facing away from the basket he may even need to twist his body in the air.

A more difficult shot made while on the run, without stopping and from one side of the basket is the *Lay Up Shot*. Assume the player is on the right hand side of the basket: he takes the ball when his right foot is coming down to the ground. Continuing his run, he jumps up as high as possible, using his left foot. He takes the ball up in front of his face and shoots at the top of the jump. The ball is laid softly against the backboard so that it drops easily into the basket.



## 20 🐾 (SPOTTY'S DANCEHALL)

self on to my stomach and edged forward in an attempt to move the microphone back. I need not have worried about Spotty's reaction. Absorbed and enamoured of his own performance as any actor, he would, I think, have allowed me to pull his tail-feathers out without even noticing.

Eventually, I managed to get the microphone back to a position where it was not in danger of disintegrating with the volume of Spotty's song. Chris and I crouched in ungainly positions while Spotty poured his soul out. He ended on a gorgeous contralto trill and then, lowering his tail and shuffling his wings once or twice, he stalked out of his dancing hall and into the undergrowth.

Chris turned and stared at me with the slightly wide-eyed, incredulous expression that always spreads over his face when things have gone right. He summed it up with his normal masterly command of understatement. 'I think that's okay,' he said.

We were back in the ride telling Jacquie of our miracle when Jim sauntered in whistling happily but unmusically to himself. Beaming at us all impartially, he laid the camera on the ground, patted it affectionately and said, 'You've no need to worry, Chris . . . it's in the bag . . . I've got the lot . . . trust Jim.'

'What have you got?' enquired Chris, suspiciously.

It was quite some time before we could get Jim to tell us simply and concisely what, in fact, he had got. It turned out to be one of the best bits of film that were taken on the trip.

Irritated by the lack of co-operation on the part of the Lyrebirds, he had plunged off into the undergrowth when he had heard them calling, and had come upon a scene which very few people witness, let alone are able to film. In a valley with sufficient light for photography to be possible, he had discovered a cock Lyrebird who had wandered over into the territory of another cock bird. The result had been something quite spectacular. The owner of the territory had cast his mist-like tail over his head and stamped forward to do battle, lurching from side to side, stamping his feet and bobbing his head. The other bird knew that he was intruding but, in order to save face, he had to put up some sort of aggressive show, so he, too, cast his tail over his head and proceeded to stamp and sway. Both birds were uttering loud, ringing and doubtless derisive cries at each other as they did this. With their tails partially obscuring their bodies, they looked like glittering, animated waterfalls on legs, and the rustling of their tail-feathers was like the sound of wind among autumn leaves. Eventually, honour having been satisfied, the intruding Lyrebird retreated and Jim had come back to us in a state of jubilation. So, in spite of being incessantly rained upon and being subjected to the coldest weather I have experienced outside Patagonia, we had been successful in filming the Lyrebirds.





# FUEL and POWER

## (Answers to last month's quiz)

I. Arrange the following countries in the descending order of per capita consumption of electricity: Japan, India, U.S.A., Norway, U.K.

1. Norway 2. U.S.A. 3. U.K. 4. Japan 5. India.

II. At the present rate of production, how long, approximately, will the oil reserves in Iran last? (a) 75 years (b) 20 years (c) 200 years.

About 20 years.

III. 1. Name two of the earliest pioneers of the steam engine. 2. In what industry was it first used?

Thomas Newcomen of England first built a steam engine in 1705. Many were sold and used to pump out water from coal mines (where the fuel was, of course, free). Previously, donkey-powered pumps were used. James Watt patented an improved model in 1769 which increased power and efficiency enough so that coal for fuel did not have to be free.

IV. Name 3 countries which are best suited for harnessing solar energy. Why?

India, Nigeria, Iran, most countries in Africa, the Middle East and Asia.

Because they receive sunshine for over 250 days in a year.

V. What is lignite? Where is it most produced in our country?

It is brown coal, which would have turned into black coal after a few million years underground. Lignite has more organic material and ash and is therefore inefficient and smoky.

It is produced at Neyveli in Tamil Nadu, where it is processed and also burnt in a specially equipped power station.

VI. 1. How is 'steam coal' different from ordinary coal? 2. What is special about 'coking coal' used in steel plants?

'Steam Coal' consists of lumps at least 2 inches wide which will not fall through the grating in a boiler. Smaller pieces are called 'slack' coal.

Coking coal has very little ash in it and when it burns it turns into a porous lump rather than into powdery ash. It can therefore be loaded into a blast furnace along with iron ore.

VII. The total installed generating capacity for electricity in our country was 19 lakh kilowatts in 1947. How much is it now, approximately?

(a) 54 lakh kw (b) 27 lakh kw (c) 200 lakh kw  
200 lakh kw.

VIII. What is gobar gas? For what can it be used?

Gobar Gas is a mixture of mainly Methane (50 to 55 per cent) and Carbon-dioxide (30 to 40 p.c.) along with Hydrogen (5 to 10 p.c.) and traces of Nitrogen and Hydrogen Sulphide.

It is generated when organic wastes decompose in a container that is sealed off from the air. It can be burned, especially in villages, for producing heat required for domestic purposes. The solids that are left over in the gobar gas generator are rich as fertiliser.

IX. Give 2 examples of how wind power is put to use.

1. Windmills directly coupled to tube well pumps.  
2. Windmill-driven electric generators  
3. Coastal sailing vessels.

X. What do the following terms mean? 1. Megawatt 2. Horse Power 3. Turbine 4. Grid.

1. It is a unit of measurement of power, equal to one million watts. 746 watts = 1 horse power. 2. It represents work done or energy produced at the rate of 550 foot pounds per second, i.e. 550 times the work done by a force of 1 pound in moving a distance of 1 foot in 1 second. 3. In an electric fan the rotation of the fan blades pushes the air. A turbine works the opposite way. It consists of a large number of fan blades mounted on one shaft. When water or air is forced past these blades, the turbine shaft rotates. 4. A link-up of two or more electric power systems into one large system.



## 19 (BENJAMIN FRANKLIN)

Finally all was settled, and Franklin returned to Philadelphia in 1785 as a hero. He was now 79 years of age and full of understanding of human nature and of the ways of the world, just in time to help in the writing of the Constitution of the new country. Franklin spoke out strongly against requiring a property qualification for voters, and also against giving the President veto

power over the legislature. These were both revolutionary ideas in those days.

There were many remarkable characters to whom America owes its independence, but Benjamin Franklin is perhaps the one who inspires the most affection. We can remember his creative enthusiasm to do things for his town and community, his useful inventions, and his lifelong dedication to freedom.



## 12 (SEVEN YEARS IN TIBET)

At last, on July 13th, we bade farewell to Gartok and started on our way. Our little caravan, now of decent proportions, consisted of our two yaks with their driver and my small donkey. Then came our young Tibetan guide, Norbu, on horseback, while we three Europeans modestly brought up the rear on foot.

On we went till we came to the source of the Brahmaputra which the Tibetans call the Tsangpo. Now the weather was continually changing, and we envied the Tibetans their practical sheepskin cloaks, belted at the waist and with long wide sleeves to take the place of gloves.

Despite inconveniences, we made good progress, stopping whenever we came to a roadhouse. From time to time we had a view of the Himalayas, which surpass in natural beauty anything I have ever seen. We met fewer and fewer nomads and the only living creatures we saw on the right bank of the Brahmaputra were gazelles and onagers. We were now approaching Gyabnak, the last name on the list of places mentioned on our travel permit, when a messenger arrived from Tradun and summoned us to go at once to that place. Two high officials wanted to see us. We had no regrets about leaving Gyabnak, which was so small that it hardly deserved to be called a place.

It was evening we marched into Tradun. In the last ray of the setting sun the red monastery with its golden roof looked like

a fairy palace on the hillside. The houses of the inhabitants, the usual mud-brick dwellings, were built behind the hill to shelter them from the wind. We found the whole population assembled and waiting for us in silence. Tea and cake were pressed upon us and questioning politely postponed. At last we were asked to show our travel permit.

It was stated there that we wanted to go to Nepal. The idea seemed to please our questioners and they promised to help us in every way. They said we could start on the following morning and be in Nepal in two days. This did not altogether suit us. Eventually, nothing was settled that evening but we wished, at all costs, to remain in Tibet and were determined not to give up the idea without a struggle.

Next day, a servant brought an invitation to luncheon from the Ponpos—as all high personages are called in Tibet. We had a wonderful meal of Chinese noodles and I think we must have appeared to be starving, to judge from the masses of food they piled on our plates. In the course of the meal, the talk gradually veered towards our problems and we heard that the authorities had decided to send a letter to the Central Government in Lhasa, communicating our request for permission to stay in Tibet. I could not help but recall the Tibetan saying which was often to stand me in good stead: the haste of Europeans has no place in Tibet. We must learn patience if we wished to arrive at the goal.

(To be Continued)





Seven-year-old Raju was quite proud of his vocabulary. One day after having alphabet soup for lunch, his grandmother asked if he wanted more.

"No, Granny," he answered, "I couldn't eat another syllable!"

Mother: Now, Anil, don't you know you are not supposed to eat with your knife?  
Anil: I know, Mother, but my fork leaks.

"What goes 'oom, oom'?" asked Walter.  
"A cow walking backward," replied David.

A salesman knocked on a door where just inside, and plainly visible, was a husky boy painfully practising his piano lesson.

"Sonny," he inquired, "is your mother at home?"

"What do you think?" snapped the boy.

Mother rushed into the playroom when she heard her five-year-old son screaming and found that the baby daughter was pulling his hair.

"Never mind," she tried to comfort him, "your baby sister doesn't understand that it hurts you."

She hadn't been out of the room for a minute when more shrieks sent her running back. This time it was the baby crying.

"What's the matter with the baby?" she asked the boy.

"Nothing much," he replied calmly. "Only now she knows".

Keshav was running errands for his sister. Among the requirements was a trip to the local store.

"I want a box of powder for my sister," said the boy.

"Certainly," replied the clerk, and aiming to have a joke, he added, "do you want the kind that goes off with a bang?"

But Keshav was equal to the occasion. "No," he answered brightly, "the kind that goes on with a puff."

Three professors were so absorbed in conversation that they didn't hear the train come in, nor did they hear the guard's whistle. But they were attracted by the puffing of the engine as the train pulled away. Then they rushed for the train, and two of them managed to scramble on, leaving the third looking on sheepishly.

The railway, official standing by, said, "Too bad, Sir, but don't worry. Two out of the three of you made it. That's a good percentage."

"Yes," sighed the professor. "The only trouble is that the other two came to see me off!"

Eight-year-old Susie was crazy about school, while her six-year-old sister was less enthusiastic.

"Let's play school," suggested Susie one day.

"All right," agreed the younger one grudgingly, "but let's play I'm absent today."

"My, the flies are terrible," complained the tourist. "Don't you folks ever shoo them?"

"Nope," answered the waiter, "we just let them walk around barefoot."

Small Boy's definition of a conscience: "Something that makes you tell your mother before your sister does!"



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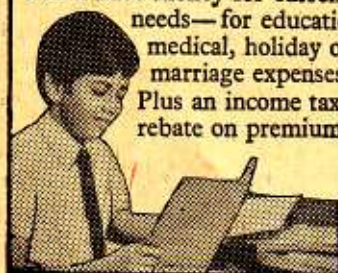
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Reading, coins, cricket.

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POONA 411001.  
Stamps, music, science.

E. J. Abraham (b 15)  
C/o E. A. Joseph  
Elenjikal Gardens  
Chandankavu  
ALLEPPEY-1, Kerala  
Stamps, games, music.

Jitendra Kumar (b 17)  
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Anand Nagar (Via Rudrur)  
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Reading, music, swimming.

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Mustaqetm Saleh Khalil (b 14)  
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Stamps, cricket, penfriends.

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D. Soma Sekhar (b 12)  
Both from:  
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JAMSHEDPUR, Bihar  
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Games, music, reading.

Jiwan M. Kerketa (b 14)  
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Himanshu N. Shah (b 15)  
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Thakker Suresh Ratilal (b 16)  
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Stamps, view cards, writing.

### FOREIGN

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Koshi Zone, Nepal.  
Penfriendship.

Asanga Hapugaskumbura (b 16)  
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Penfriends, view cards, pop-music

Geetha Gammudali (g 18)  
75, Ratmeewala  
MANIKDIWELA,  
Sri Lanka  
Stamps, reading, table tennis

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(Intemat Lo)  
Poland  
Stamps, view cards.

Imola Lipak (g 16)  
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Arpad U. 28, 2/1  
HUNGARY  
Reading, view cards, dancing.

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## NEW WORDS TO LEARN

**BENJAMIN FRANKLIN:** **arbitrary**—tyrannical or oppressive

**SEVEN YEARS IN TIBET:** **gesticulating**—expressive use of arms and legs with or instead of speech. **potentate**—monarch, ruler.

**HOW TO FACE YOUR EXAMS:** **scrutinize**—examine in detail.

**SPOTTY'S DANCEHALL:** **copse**—a number of trees growing closely together. **meandering (path)**—winding or circuitous (path). **verisimilitude**—giving an air of being true. **repertoire**—a collection of pieces that a performer knows or is ready to give. **contralto**—low singing voice of a lady. **derisive (cries)**—scoffing or mocking (cries). **incredulous**—unbelieving. **(Forest) Ride**—a road or path through a wood or forest meant for riding on.

**BASKETBALL:** **veteran (instructor)**—a person who has long experience in a particular occupation.

## POINTS WINNERS

(January-February '76)  
QUIZ ON 'FUEL AND POWER'

4 Points: Rajesh Nathan 2301.

3 Points: Mita Chatterjee 8756, M. S. Balakumar 2964, Leonardo D'Souza 2003, Sumit Roy 977/6.

2 Points: Parag P. Shah 2940, Jyoti A. Harwalkar 9962, S. Ravindrakumar 2716, Deepak Doraiswamy 2004, Sunil Chopra 9720, Pinaki Roy 4585/1, Cyprian D'Silva 9205, D. Ramesh Raghunath 2711, Smitha Krishnamurthy 3417/299, Milind Rajadhyaksha 2394.

1 Point: Malini Nagarajan 3044, Pranotosh Banerjee 977/24, Dipankar Dutta 2703, Rita Munshi 3037, I. Beulah 2557/1, Lyndon Rodrigues 4984/1.

HOW WELL HAVE YOU READ THIS ISSUE?

2 Points: Pranotosh Banerjee 977-24, Milind Rajadhyaksha 2394, T. Kanaka Raju 9831, M. S. Balakumar 2964.

1 Point: Deepak Doraiswamy 2004, Pinaki Roy 4585-1, D. Victor Sunder Raj 8811, Sunil Chopra 9720, Moses I. Pezarker 1422, Mita Chatterjee 8756.

## HOW WELL HAVE YOU READ THIS ISSUE ?

State whether the following are 'true' or 'false', giving reasons for 'false' statements. Send your answers to "Contests, Sunshine, Poona 1". The entry should be on an independent sheet, mentioning clearly name and SR Number. 2 Points for correct entries, 1 Point for one-error entries. Last Date: March 20

1. The doubling of India's population will bring all-round benefits.

2. The invention of the telephone immediately evoked a tremendous response from the public.

3. Benjamin Franklin is remembered for his fine speeches and slogans.

4. Basketball players must not crouch down while dribbling the ball.

5. Pictures can be transmitted over long distances on the principle of the telephone.

6. The palm of the hand

should not be used to push the basketball.

7. Fuel for cooking will be in increasing short supply.

8. To do his best in an examination, a student should make the maximum use of the previous night.

### LAST MONTH'S QUIZ

1. False. (It is done by making the students aware of their social responsibilities through personal work on projects!) 2. True. 3. True. 4. False. (It is contained in a gland inside its body.) 5. True. 6. False. (He was very

cautious, never taking anything for granted.) 7. True 8. True. 9. True 10. True

### CLOSING THOUGHT

Beautiful thoughts make a beautiful soul, and a beautiful soul makes a beautiful face.





# sunshine-camel

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The results will be final and no correspondence regarding the same will be considered.

Name.....Age.....

Address.....

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Vision



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